



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/777,469	02/11/2004	Atsushi Itsuki	09852/0200879-US0	2235
7278	7590	05/16/2006	EXAMINER	
DARBY & DARBY P.C. P. O. BOX 5257 NEW YORK, NY 10150-5257			LUU, CHUONG A	
			ART UNIT	PAPER NUMBER
			2818	

DATE MAILED: 05/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/777,469

Applicant(s)

ITSUKI, ATSUSHI

Examiner

Chuong A. Luu

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 2/27/2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Response to Arguments*

Applicant's arguments with respect to claims 1-10 have been considered but are moot in view of the new ground(s) of rejection.

## PRIOR ART REJECTIONS

### Statutory Basis

#### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

### The Rejections

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Myers (U.S. 5,256,487).

Myers discloses novel polysiloxane-silazane preceramic polymer compositions with

(1) the formula:  $(R_2)_2N$   $N(R_2)_2$

$(R_1) - Si - Si - (R_1)$

$(R_2)_2N$   $N(R_2)_2$

wherein  $R_1$  represents a hydrogen or methyl group, and  $R_2$  represents an ethyl group, an propyl group or tertiary butyl group (see column 15, lines 3-23).

## **PRIOR ART REJECTIONS**

### **Statutory Basis**

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

### **The Rejections**

Claims 2-4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Myers (U.S. 5,256,487) in view of Nakano et al. (U.S. 5,840,821).

Myers teaches everything above except for wherein the film forming method is one of a chemical vapor deposition method; wherein the Si-containing thin film formed is at least one selected from a SiO<sub>2</sub> thin film. However, Nakano discloses a coating solution for forming an insulating film with **(2)** wherein the film forming method is one of a chemical vapor deposition method and a liquid phase epitaxy method (see column 24, lines 47-55); **(3)** wherein the chemical vapor deposition method a thermal chemical vapor deposition method (see column 24, lines 47-55); **(4)** wherein the Si-containing thin film formed is at least one selected from a SiO<sub>2</sub> thin film (see column 24, lines 47-55); **(7)** wherein the formed Si-containing thin film does not contain Cl (see column 4, lines 9-49, column 6, lines 20-67 and column 7, lines 1-67). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made

to modify the teachings of Myers and Nakano. Doing so would facilitate the manufacture of the semiconductor device and increase the speed of the semiconductor structure.

Claims 5-6 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over N Myers (U.S. 5,256,487) in view of Nakano et al. (U.S. 5,840,821) and further in view of Lukas et al. (U.S. 20040096672 A1).

Myers and Nakano teach the outlined features above except for comprising steps of vaporizing the organic Si- containing compound, thermally decomposing the vaporized organic Si-containing compound and allowing the decomposed organic Si-containing compound to react with one of  $\text{NH}_3$  gas and  $\text{O}_2$  gas; comprising steps of vaporizing the organic Si-containing compound and an organic hafnium compound, thermally decomposing the vaporized organic Si-containing compound and the vaporized organic hafnium compound, and allowing the decomposed compounds to react with  $\text{O}_2$  gas; wherein forming the film is conducted at a temperature not greater than  $700^\circ\text{C}$ ; wherein the film forming is performed in 5 minutes or less; wherein the thickness of the Si-containing thin film is 50 nm or less. However, Lukas discloses low dielectric materials with **(5)** comprising steps of vaporizing the organic Si- containing compound, thermally decomposing the vaporized organic Si-containing compound and allowing the decomposed organic Si-containing compound to react with one of  $\text{NH}_3$  gas and  $\text{O}_2$  gas (see paragraphs [0031]-[0051]); **(6)** comprising steps of vaporizing the organic Si-containing compound and an organic hafnium compound, thermally decomposing the

Art Unit: 2818

vaporized organic Si-containing compound and the vaporized organic hafnium compound, and allowing the decomposed compounds to react with O<sub>2</sub> gas (see paragraphs [0031]-[0051]); (8) wherein forming the film is conducted at a temperature not greater than 700°C; (9) wherein the film forming is performed in 5 minutes or less; wherein the thickness of the Si-containing thin film is 50 nm or less. Since the operational parameters, such time and temperature and the thickness of the thin film are considered obvious. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Myers and Nakano (in accordance with the teaching of Lukas) within the range as claimed for the purpose of providing for reduced power consumption and increase operational speed, and it also has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art and it is noted that the applicant does not disclose criticality in the ranges claimed. In re Aller, 105 USPQ 233 (see MPEP § 2144.05).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chuong A. Luu whose telephone number is (571) 272-1902. The examiner can normally be reached on M-F (6:15-2:45).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2818

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Chuong Anh Luu  
Patent Examiner  
May 9, 2006